GARDEN AND FOREST.

PUBLISHED WEEKLY BY

THE GARDEN AND FOREST PUBLISHING CO.

OFFICE: TRIBUNE BUILDING, NEW YORK.

Conducted by . . . . . Professor C. S. SARGENT.

ENTERED AS SECOND-CLASS MATTER AT THE POST OFFICE AT NEW YORK, N. Y.

NEW YORK, WEDNESDAY, APRIL 2, 1890.

TABLE OF CONTENTS.

PAGE.

EDITORIAL ARTICLES:—The Sugar Maple. (Illustrated.)—The State of California and the Yosemite Valley 161
Sports ..... *Maxwell T. Masters, M.D.* 162
NEW OR LITTLE KNOWN PLANTS:—Syringa Pekinensis. (Illustrated.).. *C. S. S.* 164
FOREIGN CORRESPONDENCE:—London Letter ..... *W. Watson.* 164
CULTURAL DEPARTMENT:—The Potato ..... *Robert P. Harris, M.D.* 166
Some Hardy Trees and Shrubs ..... *Professor T. L. Budd.* 168
Chrysanthemums in Pots.—I ..... *T. D. Hatfield.* 168
Easter Plants ..... *W. H. Taplin.* 168
The Spring Garden ..... *J. N. Gerard.* 169
Double Cropping in the Garden ..... *W. H. Bull.* 169
Phajus tuberculosus ..... *John Weathers.* 169
Heuchera sanguinea, Aubrietia Leichtlini ..... *O.* 170
CORRESPONDENCE:—Some Practices in Grafting ..... *F. L. Temple.* 170
Longevity of the Elm ..... *Myron B. Benton.* 170
A Silva of New England ..... *F. Skinner.* 171
RECENT PUBLICATIONS 171
EXHIBITIONS:—The Flower Show at Philadelphia 171
NOTES 172
CATALOGUES RECEIVED 172
ILLUSTRATIONS:—Syringa Pekinensis, Fig. 30 165
A Sugar Maple in New Hampshire, Fig. 31 167

The Sugar Maple.

THE illustration on page 167 represents the Sugar Maple as this tree often appears when it stands in an isolated position on a New England hill-side. The subject of our illustration is in its prime, and shows the habit of the Sugar Maple at that period of its life when it has lost the rather narrow upright growth which often characterizes it during the first seventy-five years of its life and before it has taken on the broad-branched spreading habit certain individuals of this species assume in old age when soil conditions are specially favorable to their very best development.

The Sugar Maple is one of the finest of the deciduous-leaved trees of North America. It is by far the noblest of the American Maples, although the Silver Maple develops occasionally a greater trunk-girth, and it is perhaps the noblest of all the Maples, although the Sycamore Maple of Europe in the mountain valleys of the Tyrol is, when at its best, a tree second to none of its class in spread of branches and dignity of port. But the European Maple lacks the lightness and brightness of foliage and the gracefulness of inflorescence peculiar to the Sugar Maple, while it assumes in autumn none of the brilliant colors which our American tree takes on at that season of the year and which make it then the most conspicuous feature of the landscape wherever it abounds.

The Elm, to many people, is the characteristic tree of New England, because perhaps more than other trees it was selected by the early settlers to stand sentinel over their homesteads; but the Sugar Maple is hardly less characteristic of New England, and of all the Northern States, where it is almost everywhere a very common tree, growing on hill-sides and in valleys, and of late years so generally planted by the road-side that it is now more often seen than the Elm, which is a more fastidious tree than the Maple about its nourishment, more easily affected by drought, and a far more inviting prey to noxious insects.

The Sugar Maple economically is one of the most valuable American trees. The wood it produces is heavy and hard, close-grained, tough and strong. It has a surface which can be highly polished, so that it is an excellent and much esteemed furniture wood, especially those peculiar forms with twisted and contorted grain known as birdseye maple. It is from the wood of this tree that American shoe-lasts are made in preference to that of any other, and it is used in the manufacture of hundreds of other objects, great and small, from the keel of a boat to a shoe-peg. The New Englander who wants to burn better fuel than that afforded by the Sugar Maple must use Hickory. The Indians knew the value of the sap of this tree and soon taught Europeans how to convert it into sugar. The production of Maple-sugar was once a far more important industry comparatively than it is now, although the crop is steadily increasing in bulk and in money value.

The Sugar Maple has one characteristic which very few American trees, except some of the Oaks, share with it to the same degree, and one which, when American forests are managed with the view of getting from them all they can be made to produce, will make it one of the trees most generally employed in the operations of scientific silviculture. It has the capacity to germinate and grow to a considerable size under the more or less dense shade of other trees. Young Sugar Maples form sometimes in the northern counties of this state, in northern Michigan and other parts of the country where this tree is common, the larger part of the undergrowth which has sprung up in the deciduous forests. These self-sown plants, in spite of the shade which, of course, checks their growth, grow with a good deal of vigor and reach a considerable height. The Beech in Europe possesses the same power of growing for many years under and among other trees, and it is for this reason that the Beech is one of the most valuable subjects in all European deciduous-forest operations looking to natural forest-succession—the prime motive of modern scientific forestry. The Sugar Maple is a far more valuable tree in the material which it produces than the European Beech, and American foresters, when we have them, will have good cause for congratulating themselves in the possession of a subject so valuable and so easily managed.

Our illustration is made from a photograph of a tree growing in a rocky pasture at Weed's Mills, in the town of North Sandwich, New Hampshire, at an elevation of a thousand feet above the sea-level. It was taken by Dr. Wm. Herbert Rollins, of Boston, to whom we are indebted for its use.

THE Governor of California has felt impelled to write a public letter to the Senators and Representatives of that state in relation to the criticism in the *Century Magazine* of the present supervision of the Yosemite Valley. It is to be hoped that the Commissioners have a more intelligent appreciation of their responsibilities than the Governor displays, for he makes it plain that he has not the remotest comprehension of the questions under discussion. Such an exhibition in an official of his rank is not an improving one, and yet it is hardly to be regretted that some of his personal allusions were so unjust as to compel Mr. Frederick Law Olmsted to make a formal statement which explains his early connection with the administration of the valley and his attitude in relation to the present criticism, for Mr. Olmsted takes occasion besides this to state some of the obligations of government when it assumes the duty of preserving natural scenery. After saying that the remonstrance in the *Century* points to nothing in the methods of the Commissioners that would be objectionable if the concern of the nation in the matter were of the same kind that it is with the state's dealings with mineral deposits, irrigation, schools, railroads or even forests, Mr. Olmsted adds:

"If the Governor and the Commissioners are in error, their error probably lies not in any intentional disregard of the state's obligation, but in overlooking the fact that in natural scenery that which is of essential value lies in conditions of a character not to be exactly described and made the subject of specific injunctions in an Act of Congress, and not to be perfectly discriminated without other wisdom than that which is gained in schools and colleges, counting-rooms and banks.

Such qualities as are attributed by the Governor to his Commissioners—integrity, general education, business experience and what is comprehensively called good taste—do not, in themselves, qualify men to guard against the waste of such essential value, much less do they fit them to devise with artistic refinement means for reconciling with its preservation, its development and its exhibition such requirements of convenience for multitudes of travelers as must be provided in the Yosemite. Whether it is the case with these Commissioners or not, there are thousands of such estimable men who have no more sense in this respect than children, and it must be said that those most wanting in it are those least conscious of the want. Men of the qualifications attributed to the Commissioners are the best sort of men for the proper duties of an auditing and controlling board. There could be no better men for the usual business of a board of hospital trustees, for example. But the best board of hospital trustees would commit what the law regards as a crime if they assumed the duties of physicians and nurses. Ability in a landscape *designer* is, in some small degree, a native endowment, but much more it is a matter of penetrative study, discipline, training and the development through practice of a special knack. Even men of unusually happy endowment and education, who have not, also, the results of considerable working experience, can rarely have much forecasting realization of the manner in which charm of scenery is to be affected by such operations as commonly pass under the name of 'improvements.'"

In our view, this doctrine cannot be too strongly or too often insisted upon. If expert training is ever essential to the creditable performance of any work, it is needed in just such cases as this. No one but an artist in the truest sense of the word can select in a landscape the elements which fix its character, or estimate the relative importance of each in the distinctive charm which invests the whole. How to make this beauty available to visitors by artificial construction while preserving and developing in their due proportion these essential natural features is not a problem to be solved by journeymen.

We surrender more space than we usually devote to a single subject to the article below on "Sports," by Dr. Masters, the distinguished editor of the *Gardeners' Chronicle*. The subject is so important and its treatment so instructive and complete that our readers will no doubt prefer to have it entire and at once rather than in a continued form running through two or more numbers.

Sports.*

It is highly desirable that we should attach a definite signification to this word. Among gardeners it may mean many things, whilst, among botanists, it is restricted to cases of bud-variation as distinguished from variation from seed. In this note we shall use the word in its botanical sense, as applying to a special illustration of that tendency to vary which is common to all living beings. We shall, however, gain a clearer idea of what true sports are by the elimination of certain things which are not sports, though often called so. In the first place they are not seedling variations. Out of a hundred seeds of Lawson's Cypress that are sown it is possible, I suppose, to get ten more or less distinct varieties, besides others which are more or less indistinct. The great variability of this species is now well known, and the seedlings of *Abies subalpina*, Engelmann (*A. lasiocarpa* of Hooker), furnish another illustration of the same tendency. These seedlings may be the result of cross-fertilization between varieties, or they may be reversions to an earlier condition; at any rate, of whatever nature they are, they are not "sports" in the sense here intended.

Next, sports are not mere stages of growth. Most plants put on a different appearance at various periods or stages of their growth, and sometimes these changes are very remarkable. The Retinosporas of our gardens furnish us with excellent illustrations. *Retinospora* (or more strictly *Thuya*) *pisifera* exhibits during its growth very different appearances in its foliage. There is the squarrose form and the plumose form, the golden form, the silver form, the pendulous form, the thread-like form, the upright form, and perhaps others. All these, however, are not separate entities; they may all occur on the same bush. If cuttings or if grafts be taken they may be reproduced almost indefinitely.

Barring the mere color variation, these forms are but stages in the growth of the plant, occurring with more or less regularity and in greater or less degree of prominence in all the individuals of the species, as may be inferred from watching the growth of seedlings in a seed-bed.

Other illustrations of variations arising during growth are afforded by the differences often observable in the foliage on the flowering branches as contrasted with that on those branches which bear no flowers. The common Ivy furnishes an illustration. The short contracted shoots of the Laburnum, or the Apple, known as "fruit spurs," constitute other examples.

Another form of variation in flowers is that connected with difference of sex. A "pin-eyed" Primrose does not greatly differ in appearance from a "thrum-eyed" one, yet the difference between them is precisely of the same character as that between the variously formed flowers of some species of Catasetum and Mormodes. So utterly different are the male and female flowers of some of these species that they were at first placed by very competent botanists in different genera. It was only when the protean plants produced all the forms of flowers on one and the same spike, that it was seen that so far from belonging to different genera, they did not even belong to different species. It was left to Darwin to show what this paradoxical variation really means; and now, when we meet with a case of the kind, we say, "Ah! yes; only a sexual form," just as if we had known all about it from our earliest years, and very possibly, in our haste, mixing up, or, at least, not discriminating cases of a different nature. But this is not what we propose to discuss just now; we simply say that these cases, though often so designated, are not sports, at least in our acceptation of the term.

What, then, are sports? We have already characterized them as "bud-variations," but we must give some further indication of their peculiarities: First, as to the suddenness of their production. A tree or a shrub, all on a sudden and without any cause—that is, apparent to the eye—will put forth a bud, which, as it lengthens into a shoot, displays leaves of a different character to any that the plant has hitherto produced, which have no definite relation to any particular stage of growth and which are quite different from any that under ordinary circumstances the plant in question has produced or is likely to produce in future. In short, the occurrence is sudden and unforeseen. Gardeners, of course, avail themselves of these variations. They remove them, bud them, graft them, strike them from cuttings, or, in some way or another, endeavor to perpetuate the variety, and thus have originated our cut leaved Beeches, Maples and Limes. Thus, too, may have originated some of our weeping trees and some of our pyramidal shrubs, though, for the most part, these have, as I believe, originated as seedling variations.

Not only do these variations occur suddenly, but they are very local in their manifestation. One particular shoot "sports," while all the rest remain in their normal condition. It is very different in the case of seedling varieties, where the whole system of branches and leaves is more or less affected.

Another and a most remarkable feature about these sports is, that they sometimes occur simultaneously in widely different localities; thus the same sport of a Chrysanthemum "turns up" about the same time, not only in different nurseries in this country, but also on the Continent. This may be because all the plants in question have originated from one and the same stock.

These, then, are the special characteristics of a true sport. Illustrations could be given by the hundred; but neither time nor space permit, nor, indeed, for our present purpose, is it requisite to do so. Whoever will investigate the cause of these sudden outbursts of local variation must, of course, sedulously examine each case for himself according to the measure of his ability and of his opportunity. The circumstances, the history, the progress, the anatomy of each particular sport must be investigated, both absolutely and in relation to similar outgrowths in other plants. Until this is done—and it has not been done yet—any explanation as to the cause of the phenomenon must be a matter of speculation. Still, we can not help guessing, and though we may be wrong in our surmises, at least the process does good by setting us observing and thinking. Observing and thinking are processes

*The notes here published represent the substance of an unwritten address lately given to a society of gardeners. It is necessary to mention this circumstance to account for the form in which they are couched, and for the circumstance that no reference to authorities is made. This was not necessary at the time, as numerous illustrations of the things themselves were on the table. Those who desire to look into the literature of the subject should consult the writings of Meehan, Morren, Naudin and others, and will find an excellent summary in Carrière's "Production et Fixation des Variétés," and in Darwin's "Variation of Animals and Plants."

valuable to all of us, but in a particular degree to those who practice the cultural arts. And so it happens—or, at least, we will hope so—that although the causes which have been assigned for these changes are various, some, perhaps, utterly wrong, others partially so, and all more or less inadequate to explain the whole of the phenomena, yet some advantage may accrue from the discussion. An indirect benefit is better than none at all, and anything which enforces us to take some measure of the extent of our own ignorance is likely to be beneficial. We should never be a bit the better if we simply acknowledged our ignorance, as, indeed, we needs must do in any case, but directly we attempt to find out in what particulars and in what degree we are ignorant, then there is some hope that some portion of our "nescience" may be dispelled. Under this impression we may allude to one or two of the assigned causes of sporting. External causes are those which the gardener most generally invokes. For him a sport is usually the consequence of some alteration in the nutrition of the plant. It gets too much or too little food, or the food is not of a suitable character—containing too much of one thing, too little of another, or the climate is charged with the results observed. It is very convenient to have the weather to blame; it may be too hot or too cold, too moist or too dry, too brilliant or too obscure; or the soil may be at fault, the drainage may be defective, the earth not sufficiently aërated, its temperature too high or too low. Combined action of some of these conditions is, of course, possible, intermittent action equally so, whilst we, in this country, are abundantly familiar, first, with one thing in the way of the weather, and immediately afterward with another. It is, therefore, not surprising if some gardeners, without troubling themselves much to see how the explanation fits the facts, do attribute "sports" to such causes as we have mentioned. To our thinking the objections to this kind of explanation are fatal. External circumstances are, no doubt, potent enough to effect very great changes indeed. We are daily witnesses of them; but they do not produce the kind of change which we know as "sports." On the contrary, sports occur sometimes when no alteration of external conditions is perceptible, and they do not occur when such alterations are very apparent. Or, again, they appear in one place under one set of circumstances, and at another place, simultaneously, under a different state of affairs; and although all the plants growing together have been exposed to the changed conditions of life, the sporting tendency shows itself in one particular plant only, and in one particular part of that plant, generally only in one bud. With all respect, then, for those who hold these views—and one at least of our most experienced and eminent plant-growers has lately publicly advocated them—we venture to think external causes, however adequate they may be in some cases, are inoperative in such cases as we are considering.

A better explanation is that offered by Darwin, by Naudin and others, according to which sports are due to a dissociation of mixed elements, a reversion to the character possessed by one or other of the ancestors of the plant, perhaps one or two, perhaps an indefinite number of generations ago. Let us recall for a moment what a very composite thing a plant is, even such a one as we call a simple plant. At first it is neutral and homogeneous, a mass of protoplasm—containing cells—at least so it was once said, but the homogeneity of protoplasm is a thing of the past. We don't believe in it now. On the contrary, we believe in frameworks and interstitial fluid, in granules and fibres, in some parts that are alive, others that are dead; some that are stable and immutable, others that are mobile and changeable; in short, we have come to the conclusion that, physically and mechanically, as it was previously known to be chemically, protoplasm is very much "mixed."

Again, another of our old beliefs has been dissipated. Once we were taught that the cells of plants were closed bags without apertures, and that, while the fluid passed from cell to cell by osmosis, there were no visible pores, and no means of transmitting anything more solid than cell-sap. The passage of protoplasm from cell to cell was not then thought of as possible. But Mr. Walter Gardiner has changed all that. He, and others who have followed in his steps, have taught us how to see the pores in the cell-walls, how to see the passage of protoplasm through those pores from cell to cell, and how complacently to employ the phrase "continuity of protoplasm" in a manner that gives us, at present at least, great satisfaction. These modern discoveries of the composite nature of protoplasm, and of its passage, at certain times and under certain conditions, from cell to cell, seem to us to furnish a clue to the explanation of some of these cases of sporting as they do also in the case of some of those curious cases in which the stock seems to influence the scion, or the scion the stock, in cases of grafting.

Again, in the life history of a plant there are several stages. There is the neutral stage, when it is, at any rate, so far as sex is concerned, an epicene. Then there is the sperm stage, when our plant consists of a mass of neutral matter, a particular portion of which is developed into sperm-cells, or into what will ultimately produce them. At another time the neutral cells of one portion of the general plant-mass develop into germ or female cells, or it may happen that both sperm and germ-cells may be developed at one and the same time, when the plant has, of course, a three-fold constitution.

All these modifications occur in the course of the life of each individual plant. But each individual plant is, necessarily, compounded of elements derived from its two parents, so that, for illustration sake, if we may consider the original stock to consist of three portions—neutral, male and female, respectively—it is obvious that in the first generation there would be six component elements; in the second, twelve; in the third, twenty-four, and so on. Who can count the generations of plants? It is enough for our purpose if we succeed in showing clearly the composite nature of plants.

This being granted, it will not seem remarkable that occasionally a partial separation takes place, just as a scum may rise to the surface of some mixed fluid, or a sediment fall to the bottom of another. This illustration may, perhaps, serve to suggest the reason for the separation of mixed elements in plants; but that is too speculative a matter for us to enter upon here. It will be better for our present purpose to note one or two examples of dissociation of mixed characters wherein both the fact and its explanation are clear. One of the most interesting is that narrated by Mr. Noble, the originator of the white form of Jackman's Clematis. Noble's Clematis, as we may here shortly call it, is the result of a cross between Jackman's Clematis and *C. patens*. Soon after this Clematis was sent out, some dissatisfaction arose because instead of producing flowers of good form and purity of coloring, more or less misshapen blooms of an unattractive appearance were formed. The matter was mysterious. The raiser was blamed by those who did not know that he is a highly competent man in his business, and one whose integrity is beyond question.

The plant was condemned. Fortunately, however, the edict was not carried out in its entirety—some specimens were left. These were watched, and in due time afforded the explanation of the mystery. Jackman's Clematis flowers in the autumn on shoots formed during the spring and summer—on the new wood, as gardeners say, just as happens with a Rose. *Clematis patens* flowers in spring on shoots that were formed during the previous summer, on the old wood, in gardening phrase. Now, when Noble's Clematis came to be scrutinized, it was found that it produced two kinds of flowers—those which expand in spring are solitary, semi-double, never white, but bluish gray, like those of *C. patens*. Those which unfold in autumn are produced in pairs and are single, like those of *C. Jackmanni*, but white. In the spring no flowers of the Jackmanni type are ever seen, and when the old wood is cut away, and only new wood thus suffered to produce flowers, no blooms of the Patens character are seen, but only those of the Jackman type.

Another very interesting case of unmixing, or, if it be preferred, of partial mixture, is afforded by Neubert's Berberis. This is a hybrid between the evergreen pinnate-leaved Mahonia and the deciduous, simple-leaved *Berberis vulgaris*, and it bears leaves some of which are intermediate in appearance, while others are like those of one or of the other of its parents.

The two illustrations above given are instances of the results of cross-fertilization, in which the whole process has, so to speak, taken place under our own eyes. But for how many centuries has the Chrysanthemum, we will say, been crossed and recrossed and crossed again? This process of crossing seems destined to come to an end because the flowers, after a time, become sterile, owing to the fact that the stamens and pistils, one or both, are imperfectly or not at all developed. Seedling variations in such cases must become more and more rare as the process of sterilization becomes more and more marked. If new seedlings are desired, raisers will have to go back to less highly modified flowers, to flowers, that is, which are more nearly in their original condition. But although the production of varieties in the Chrysanthemum by fertilization is thus limited, the development of sports by bud-variation may, and probably will, still go on, to the delight of the grower and the interest of the student. It must, however, be said that at least in the case of the Chrysanthemum the change is sometimes very slight, depending solely on the

presence of coloring matter in some cases and on its absence in others. The form of the flower and of the foliage in many of these Chrysanthemum-sports is in no wise different from that of the parent plant. This is only an illustration of the fact that all degrees of combination or of dissociation, as the case may be, may be expected to occur.

Is there any commingling of the elements of stock and of scion in the case of grafts? Botanists and gardeners, almost without exception, have asserted that there is none. Place on a sheet of wet blotting paper, which may represent the stock, a drier piece of the same substance, which may represent the graft, and there will be a passage of the fluid from the lower to the upper paper, but there will be no mixture of the constituents of the two.

We have always wondered if there were no reciprocal influence of stock on scion, why grafting is practiced at all, because we cannot understand the acknowledged advantages of the practice except upon the supposition of some modification being exerted. Gardeners triumphantly, as they were quite justified in doing, pointed to the millions upon millions of cases where no such modifications are visible. Botanists pointed to the closed cells from whose cavities only the thinnest of liquids could exude and permeate through the walls of adjoining cells. This was before the days of "continuity of protoplasm," as above mentioned. Now that we know that not only water, but protoplasm itself, may, under certain circumstances, pass from cell to cell, the difficulties in the way of conceiving that any influence could be exerted on the scion by the stock, or vice versa, are very materially lessened, if not entirely removed.

But before the time we speak of, there were some alleged facts which, provided the history given were true, could only be explained on the supposition of the commingling of elements by grafting and subsequent separation. In other words, the possibility of graft-hybridization must be assumed. Whether it has been proved is another matter.

One of the strongest cases in its favor that we know of is that of the famous Adams' *Laburnum Cytisus Adami*. We cannot go into detail as to the history of this extraordinary tree. It must suffice to say, that it is stated to have originated from the implantation of a bud of the dwarf, shrubby, lilac-flowered *Cytisus purpureus* onto the common Laburnum. Be this as it may, we have in our gardens on this side of the Atlantic trees which every year astonish the beholder by producing, together with the foliage and flowers of the Laburnum, tufts of *Cytisus purpureus* and all sorts of intermediate conditions between the two. If the stock exerted no influence on the scion, the buds should be pure *Cytisus purpureus* and pure *C. Laburnum*, without any intermediate forms. It would lead me too far to give other illustrations of the production of shoots of an intermediate character between stock and scion. Many such are on record, and many have come under my own notice. It must suffice for me to show that whilst we may, with a very great amount of probability, attribute the existence of some sports to the "un-mixing" of elements blended by means of cross-fertilization, whether between species (hybrids), or between varieties (cross-breds). We may, likewise, but with a less degree of probability, attribute the existence of others to a similar dissociation in the case of grafted plants.

Obviously the latter cases must be much less numerous than the former, and are purely artificial productions, not likely to occur in Nature.

Other assigned causes appear to me to pertain rather to variation in general than to that limited, localized form of it which is here considered as bud-variation, and may be here passed with the mere mention. *Maxwell T. Masters.*

London.

New or Little Known Plants.

Syringa Pekinensis.

THIS plant (Fig. 30) flowered in the Arnold Arboretum and in one or two other gardens near Boston last June for the first time, having been raised from seed sent from Pekin by Dr. Bretschneider.

Syringa Pekinensis is a wide-spreading shrub with slender branches covered with light yellow-brown bark, marked with minute wart-like excrescences, and rather stout winter-buds, with broadly ovate, blunt, membranaceous, chestnut-brown scales, with scarious, ciliolate margins. The terminal bud, as is the case always with the common Lilac, does not develop. The bark of the principal stems is thin and light yellow, separating into delicate flakes, and is not unlike that of a young Yellow Birch-tree. The leaves are ovate or deltoid, obtuse or acuminate, rounded at the base or gradually contracted into a slender-channeled petiole. They are dark green, opaque on the upper, and rather paler on the lower surface. The inflorescence is a short, compact thyrsus, only four to six inches long, surrounded and much covered by the shoots of the year, which complete their growth before the flowers open. These are white, with a membranaceous, nearly entire calyx enclosing the short tube of the corolla, and emit a disagreeable odor not unlike that of the flowers of the common Privet, which they much resemble.

Mr. Hemsley refers *Syringa Pekinensis*, in his enumeration of Chinese plants, to *S. Amurensis*, and judged by the plants in cultivation in the Arboretum, he is doubtless correct in doing so, although, from a garden point of view, the habits of the two plants are so dissimilar that it may be well, perhaps, for cultural purposes, to retain the two names. The flowers of these two plants are indistinguishable, and the leaves vary only in size. The color of the bark of the branches is the same in both, and so are the scales of the winter-buds. *Syringa Pekinensis* has, however, much more slender branches than the Amoor plant; the winter-buds are smaller, and its whole habit and appearance are lighter and more graceful. The inflorescence is smaller, more compact and less showy. *Syringa Pekinensis* is evidently not free-blooming, in its young state at least. The plants were ten feet high in the Arboretum before they flowered at all, and when a few of them did flower at last, these large plants bore three or four small panicles only.

Syringa Pekinensis, judged by the little that is now known of it in gardens, is the least valuable of all the Lilacs as a flowering plant. It is very hardy, however, and grows rapidly, and its habit is good. The plants all show a tendency to develop pendulous branches, and it was one of the Arboretum seedlings, in which this tendency was rather more strongly developed than usual, which was the origin of the so-called "Weeping Lilac," which has been unduly extolled, in view of the fact that nothing was known at all until last year about the flowers. Now that the plant has flowered, it is seen how very far it falls short of what has been claimed for it. *C. S. S.*

Foreign Correspondence.

London Letter.

Royal Horticultural Society.—An exhibition of more than ordinary interest was the result of the meeting held on Tuesday last at Westminster. Orchids were represented by large groups of Dendrobiums, among which the following were conspicuous: *D. Aspasia* ×, raised by Messrs. Veitch from *D. aureum* and *D. Wardianum*. It has the pseudo-bulbs and habit of the last named, and large, prettily marked, fragrant flowers, in which the colors and form of both parents are blended; *D. lituiflorum superbum* (Sander & Co.), remarkable for the large size and deep color of its flowers; *D. signatum* and *D. Smilliæ*. Well flowered plants of *Phajus tuberculosus* and a beautiful example of the new hybrid raised by Mr. Cookson from the last named and *P. Wallichii*, were among Mr. Sander's exhibits, as also was a plant in flower of the rare and elegant little *Cypripedium Schomburgkianum*, which has been lately introduced from the regions of the Roraima in British Guiana. A charming variety of *Odontoglossum Pescatorei*, named *melanocentrum*, bearing a stout, branched spike of flowers, which are large and pure white, with a blotch of purplish crimson on the base of the lip, came from Mr. Tantz, of Hammersmith. *Lycaste Skinneri*, Young's variety, is distinct and decidedly pretty in the tinting of its flowers, which are of medium size, pure white, the lip and petals tinged with a pale coppery hue. Several hybrid Cypripediums, interesting only as hybrids, but of no beauty, were exhibited, and a plant of the singular hybrid Cymbidium, raised by Messrs. Veitch from *C. eburneum* and *C. Lowianum*, was also shown in flower. A collection of plants sent from Kew comprised *Godwinia gigas* in flower, the spathe deep purple, boat-shaped, twenty-one inches long and six inches wide; *Dracontium*

Carderi, like the Godwinia, but smaller; *Arisæma speciosum*, large examples; and *A. præcox;* a large specimen of *Tacca artocarpifolia*, with flowers on stalks eight feet high, and the subject of much interest and speculation, most people being unacquainted with it; *Strelitzia Nicolai*, the flower-spike bearing its large, strangely formed, white and blue flowers; *Buphane toxicaria*, the poison-bulb of the Kaffirs, bearing a head of flowers a foot across, and suggesting some of the Hæmanthi; *Æchmea glomerata*, whose large, stout spike of blue flowers, springing from compact, cushion-like clusters of scarlet bracts, is both handsome and singular; *Brownea Ariza*, a fine head of rosy red flowers; *Rondeletia amæna*, a handsome stove shrub, with large, oblong leaves and compact terminal bunches of pale flesh-colored flowers.

A double-stemmed plant of the new and delightful little

Fig. 30.—Syringa Pekinensis.—See page 164.

Phœnix Rœbelini was exhibited, and received, as it deserved, a first-class certificate.

Hybrid Hippeastrums.—The magnificent garden race of Hippeastrums which we now possess is the result of nearly a century's careful breeding and selecting from such of the species as possessed the qualities necessary in a good breeder. According to Herbert, the first hybrid Amaryllid that appeared in our gardens was the mule between *H. vittatum* and *H. regium*, which was raised by a nurseryman named Johnson in 1810 and named Johnsoni. In the following year Herbert himself raised several hybrids, and in his "Amaryllidaceæ," published in 1837, he enumerates thirty-one hybrid Hippeastrums which had been raised in England. His observations on this genus and his success in breeding from the species were no doubt the cause of the work being taken up by the late M. Louis Van Houtte, of Ghent, and by the elder De Graaf, both of whom raised many hybrids and crosses. De Graaf the younger is now a most successful breeder and grower of these plants, many of his seedlings being almost, if not quite, equal to the best hitherto raised. The majority, however, of the very best among garden Hippeastrums we owe to the skill of Messrs. Veitch, of Chelsea, who have raised an enormous number of kinds since they commenced operations with these plants, twenty-three years ago. In a paper read by Mr. H. Veitch on Tuesday last, at the meeting of the Royal Horticultural Society, the subject of Hippeastrums and their culture was treated in a most interesting and instructive manner. An exhibit of plants in flower, representing the species, first hybrids and the choicest of the seedlings raised from them, formed a perfect object-lesson, and showed much better than any words could how great an improvement had been made in the flowers by breeding. As an illustration of what can be done by means of hybridizing and selecting to alter and improve the character of flowers so as to bring them up to the florist's standard of excellence, the exhibit and paper by Mr. Veitch were simply perfection. From the form, substance and color of the progenitors, such as *H. Leopoldii* and *H. equestre*, to those of some of the latest of Messrs. Veitch's seedlings, such as that called Champion, is a really marvelous advance to have achieved. Champion has a shallow tube of great substance, the segments each four inches wide, the whole flower measuring eleven inches in diameter. Its color is rich crimson-scarlet, with a velvety sheen and a small star of green at the base of the tube.

The species first employed as breeders by Messrs. Veitch were *H. pardinum* and *H. Leopoldii*, both introduced by themselves from Peru. The result of this cross did not prove satisfactory, neither did a cross between the last named and *H. aulicum*. When a mule was crossed again with one of its parents, the offspring were, as a rule, almost identical with the

species, the characters of the mule being scarcely shown. The most important "break" was obtained by crossing *H. Leopoldii* with a seedling named Empress of India, these two yielding a race which Messrs. Veitch at once saw was capable of being moulded into one of considerable garden value. A large number of the most popular kinds have resulted from this cross. A serious defect in the earlier hybrids, which runs through almost all the species of Hippeastrum, is the large star-like blotch of green at the base of the tube, giving the flowers a coarse and sometimes ugly appearance. To get rid of this defect has been the aim of Messrs. Veitch for some years, and that they have succeeded was abundantly evident in the varieties exhibited.

A race of kinds which flower in the autumn was the outcome of breeding, from *H. Leopoldii* and *H. reticulatum*, the latter a free-flowering plant of elegant habit, with a broad band of white along the mid-rib of the leaf. It blooms in September and is evergreen. In the progeny of these we have such handsome seedlings as Mrs. Garfield, Mrs. Lee and Autumn Beauty.

Of the thirty-eight species of Hippeastrum recognized by Mr. Baker in his recently published monograph, only very few are now in cultivation in England. Invariably, when a race of any genus has been obtained in gardens and is superior in horticultural characters to the species themselves, the latter are allowed to drop out of cultivation. Efforts have been made at Kew to procure all the species possible, but so far there are only thirteen species represented.

The cultural directions given in Mr. Veitch's paper are of special value—nowhere are these plants grown so well as at the Chelsea Nursery, where a large house is devoted to their culture, and where the plants, when in flower, form a magnificent picture. Whatever may be the case in America, here in England the Hippeastrums are often a failure in ordinary gardens. The chief cause of failure is, no doubt, the same as in the case of many bulbous plants—namely, neglect to allow the plants sufficient rest by withholding water and exposing them to sun and air. Excessive watering is, as Mr. Veitch stated, most fatal to these plants. They like plenty when in active growth, but it must be entirely withheld during the season of ripening and rest.

The soil recommended by Mr. Veitch is two parts loam, one part rotten cow-manure and one part sand, the whole to be mixed and exposed to the air for about three months before it is used. Pots should always be small in comparison with the size of the bulb, and they should be well drained. The plants are repotted annually by Messrs. Veitch, though some growers prefer to repot only every two years. All the soil is shaken off the roots, the dead ones cut away and any rotten scales removed from the bulbs. This is done in January, when the plants are repotted. They are placed in a temperature of fifty-five degrees Fahr. for a fortnight and then plunged in a bed of tan, the temperature being raised five degrees higher. Air is given on all bright, warm days, but the plants are never shaded. The flowers develop within about ten weeks after the plants have been repotted. When they have ceased growing the plants are taken out of the tan, less water is given, and the house is kept drier and more airy.

London. *W. Watson.*

Cultural Department.

The Potato.

THE first great advance in perfecting the quality of the Potato was made in the production of the Mercer variety, which was named after the county in New York where it originated. Being large, white-fleshed and mealy, it soon took the preference over the Blueskin, Foxsite and other varieties of the period, and spread throughout the country from Maine to the far west. In time the Mercer deteriorated, became subject to disease, and the plants decayed prematurely.

The potato-rot of 1844 and in later years worked a revolution in Potato culture, mainly through the wisdom of the Rev. Chauncey E. Goodrich, chaplain of the Insane Hospital at Utica, who conceived the idea that to make the tubers hardy they should be reproduced from wild Peruvian and Chilian stock. With this view he imported wild tubers in the years 1849, 1850 and 1851, and by cultivation produced in 1853 the Garnet Chili, which became the parent of a long line of hardy, improved, palatable, white-fleshed tubers obtained by hybridization. Mr. Goodrich is credited in Europe with having established a new era in Potato growing, from the thousands of seedlings which he tried and distributed for trial. His work was one of pure philanthropy. Other men made large sums of money out of his valuable novelties, while he contented himself with the good he was doing to humanity. He died poor, when perhaps he ought to have been more provident, as his daughters were obliged to live by teaching.

Wild Chilian Potatoes have also quite recently been tested and found unusually hardy by my correspondent, the celebrated botanist and seedsman, M. Henrie Vilmorin, of Paris, who is celebrated for his zeal in introducing and domesticating wild esculents. Although Baron von Humboldt stated that there were no Potatoes under cultivation in Mexico at the time of the conquest, wild tubers from her mountain lands have been grown in France and in this vicinity. The effect of cultivating wild tubers in a rich soil is shown by a persevering experiment made by Mr. Alfred Rose, of Yates County, New York. About the year 1879 he planted one wild potato of the size of a pea and obtained as a product one tuber of the same size. Such a result would have ended the trial with many; but he planted this little product and obtained a tuber of the size of a large pear, which, being planted, did still better, until in the sixth season there was a product of nine tubers, the planting of which, in the seventh summer, yielded nearly two bushels of smooth, handsome potatoes, weighing from four ounces to a pound each.

The experiments of Goodrich deserve repeating on a much larger scale, and with wild tubers of California, Arizona, Texas, Mexico, Central America, Peru and Chili. Selections of these should be used in hybridization, and their seed-products planted and tested until new, valuable and hardy potatoes are obtained for the table. There was a fortune in the production of Bresee's Early Rose, and this result may be repeated. Our late Secretary, Mr. A. W. Harrison, gave this potato its name from its character and color, and on one occasion he made an exhibition of some of Mr. Goodrich's seedlings in bushels at the autumnal fair of our society, raised by him in Germantown.

Fabulous sums were paid for the Early Rose the year of its production. I have known of $20 having been paid for a peck, $3 for a pound and $2 for a five-ounce tuber, this last by the late Peter Henderson, who produced from it a crop of 450 pounds from 150 plants raised by forcing, sprouting and rooting. By this system, in a hot-bed, 2,000 plants, and almost 2,000 pounds of potatoes, have been produced from one pound, or by measure thirty-three bushels, of Ruby Potatoes, worth at the time $74.

The value of a new Potato does not depend altogether upon its size, form, productiveness, hardiness and taste; for we must also consider the proportion of starch which it yields by analysis, a test of quality which is too seldom employed. On the average a potato will yield in October from eighteen to twenty per cent. of starch and seventy-five per cent. of water, but the former ranges from ten to twenty-three per cent., and the latter from sixty-eight to eighty-two per cent. The starch exists in the largest proportion in October, and diminishes gradually until April, when the loss is sometimes as much as three per cent.

Potatoes should be boiled in their skins if economy is to be considered, as the loss to the water is then only three per cent. as against fourteen where they have been pared; or from two to three ounces in the pound, which is a very considerable waste.

As the Potato plant and tuber contain a large proportion of potash, this alkali is an important element in the plant-food for a crop of tubers. Mr. Harrison grew his valuable crop of Goodrich seedlings on a piece of what was rated as worn-out land, by the aid of an abundant dressing of wood-ashes.

The potatoes of to-day are quite different in appearance from those grown fifty years ago, when their eyes were much sunken, and their surfaces covered with nodules. American tubers are much more symmetrically formed than those of foreign countries in general, and of more uniform size. Very large tubers evince a richness of soil, but are no special advantage to the consumer. Russia produces very large potatoes, but they have deeply set eyes, and are not invitingly-shaped. The tubers of Europe are generally light yellow in flesh; some are very dark-skinned; and the more common shape is short and thick. Selection of shapes for planting should improve the form of the potato, as it has done with the tomato. "Plant the best, and eat or sell the balance," is a rule that holds good for crops in general; but it is a difficult one to secure acquiescence in among the ignorant and improvident. Following just the opposite in Ireland has had much to do with her potato failures and famines. It is a self-denial not to eat the best of the crop, when the lower grades will sprout and grow, but this self-denial pays in the end, whether it be in the potato, Indian corn or wheat.—*From a paper read before the Pennsylvania Horticultural Society by Robert P. Harris, M.D.*

Fig. 31.—A Sugar Maple in New Hampshire.—See page 161.

Some Hardy Trees and Shrubs.

I HAVE just read the notes of Mr. Jack, under the heading of "Exotic Shrubs in Canada," and wish to say that the shrubs found hardy near Montreal are equally hardy in our dry interior climate. The Yellow-wood (*Cladrastis lutea*) we are surprised to find a true iron-clad during our recent trying seasons. This is remarkable, as we have found no other tree or shrub from the south truly hardy here, and even the forest-trees and shrubs of the New England States fail to endure our hot, dry summers and cold winters. *Rosa rugosa* is perfect here, but this is not strange, as I believe it to be indigenous to extreme east Europe and north-central Asia. We have varieties of it from east-central Russia that do not differ materially from those we have from China and Japan, and we have nearly double varieties which we were told originated long ago in west Asia. One of these has quite large, dark purple, fragrant flowers, with an average of over forty petals. All the Caraganas are perfect here, and *C. arborescens* is decidedly tree-like in habit. Some of the large-flowering dwarf species, top-worked on *C. arborescens*, make very desirable miniature trees for lawns. We have some specimens that attract more attention than any trees on the grounds.

The many varieties of the Bush Honeysuckles from east Europe and north-central Asia are perfect here, and the same is true of all the species and varieties of Philadelphus except those from south Europe and south Asia.

Of the Forsythias we find *F. suspensa* the hardiest, and, if properly trained on a trellis, by far the most ornamental. *Euonymus nanus* is a native of the north slopes of the Caucasus range and of the steppes north of it, and it proves perfectly at home on our prairies. Aside from the conifers, it is the only plant that holds its leaves with perfect color during the whole winter. It fruits with us very abundantly, which, I believe, it does not do in south Europe, and I suspect not very perfectly at Boston or Montreal.

Hydrangea paniculata is perfect in plant and flower with us, and I suspect its original home was north-central Asia.

Tamarix tetranda we have not tried; but *T. Amurensis* is hardy with us, and a far better plant than *T. Germanica*, which is tender.

Ames, Iowa. *J. L. Budd.*

Chrysanthemums in Pots.—I.

AS between planting out Chrysanthemums and growing them continuously in pots, opinions vary. Those who plant, argue that less attention is required and larger plants are obtained. My experience is, that for all purposes continuously pot-grown plants are preferable, and especially is this true of those required for specimen plants; while with pot-grown plants for specimen blooms more substance and better color are obtained.

The methods of growers vary. Some use elaborate compositions of soil, mixed with almost chemical exactness; others are satisfied with any ordinary rich loam, believing, as I do, that it is the after-treatment that counts. Some give as many as three changes, or shifts, before the final potting, which they make in June; others only two, and make the final shift in May. Some rigorously remove all suckers as they appear; others vary their practice with different varieties.

The soil used from the first shift onward should be composed of some good, light, fibrous loam, being turf laid up the fall previously, alternately layered with cow-manure and road-scrapings. If heavy loam only be available, horse-manure had better be substituted. A little lime might be beneficial, but is not essential. What is important, is to have good loam in a moderately dry state and to pack it firmly, leaving the feeding of the plants until later in the season.

Presuming plants are well established in three or four-inch pots by the first week in April, I would shift at once into six-inch pots if intended ultimately for tens, and into seven-inch pots if intended for twelves. The plants should have been stopped once, but if this has not been done, the work should be delayed for a week, until they are somewhat established. Unless there be good light and facilities for airing in the greenhouse, the plants should be moved into a cold frame by the second week in April, plunged in sand and protected at night until all danger of frost is past. The final potting may then begin and it may extend over two weeks, beginning with the earlier and stronger varieties intended for ten-inch pots, giving the weaker-growing varieties and those intended for the largest pots a little more time. I take particular pains to have the pots clean, inside as well as out, and well drained. The soil is packed quite firmly, leaving about two inches for watering or a top dressing, if it should seem necessary. Water should be given sparingly for a week or ten days, unless the weather be very dry. I would rather return them to the frames so as to be able to lay over a few sashes during heavy rains. This is more important than it may seem, as a heavy soaking before new roots have developed is really injurious.

We plunge the pots in the ground nearly to the rims, three feet apart and four between the rows. Last year a potter made for us circular disks of earthenware, six inches in diameter by one thick, with a bore in the centre two inches wide; these are set into the ground and the pots are placed upon them. This contrivance, simple as it is, keeps the drainage free, as it effectually prevents worms from entering the pots from the ground. The clogging of the drainage in pots by worms has always been a great obstacle to growing plants in pots, especially during the feeding season, when free passage of water is essential.

I hose my plants freely after bright days during June and July—a practice which keeps the plants clean, and which seems beneficial in other ways which I cannot explain.

Wellesley, Mass. *T. D. Hatfield.*

Easter Plants.

THE use of flowering plants in special decorations for Easter observances is increasing, and not only in decorations, for it seems in many instances that a Lily or some other plant in flower is preferred to the elaborate Easter card of previous seasons.

The increase of these pleasant customs is, of course, a profitable thing for the florist, though with the extended demand there has also been a great increase in the supply; in fact, the supply may be too abundant, and in consequence lower prices may prevail. But while this class of business counts as an important item in many commercial establishments, it requires much care on the part of the grower. For instance, one may be preparing a large lot of *Lilium longiflorum*, and if so it will be found practically impossible to induce all the plants in a thousand or more bulbs to grow at the same rate, even though under apparently the same conditions, and in consequence the more forward plants must be sorted out and placed in a cooler temperature so as to allow the remainder of the lot to catch up with them; or the slow growers must be hurried by increased heat and feeding. In fact, this sorting operation may have to be gone through several times, so as to bring the entire lot into an even condition by the week before Easter.

There still exists a considerable difference of opinion as to the respective claims of *Lilium Harrisii* and *Lilium longiflorum* for Easter work. Of course it is admitted that for early forcing *L. Harrisii* is superior, and in size of flower it also takes the lead, but for actual beauty and for lasting qualities *L. longiflorum* still holds its own, and its flowers not being pendant the plants can be packed much more readily for transportation.

The Ascension Lily, as it is sometimes called (*Lilium candidum*), is also grown in quantity in some localities for Easter use, and while not so showy as the preceding sorts, is very beautiful, and especially useful for cutting.

Lilium candidum will not bear hard forcing, and consequently should be started into growth so early that it may be kept in a cool house, because when exposed to too high a temperature the loss of the lower leaves usually follows, and thus the full beauty of the plant is lost.

Next in importance to the Liliums among Easter plants may be mentioned the Hydrangeas, the forcing of which has attained large proportions of late years, though the prevalence of cloudy, dark weather during the present season, together with an early Easter, has somewhat upset the calculations of producers. Still, among so large a number of growers near the various floral centres, it is scarcely likely that there will be a Hydrangea famine this year.

As to varieties for forcing, *H. hortensis* and *H. Thomas Hogg* take the lead and in the order named, though the latter is purer in color than the former, and where white is essential, of course it takes first place. *Azalea Indica* in variety is indispensable at this season, large quantities being annually imported from Belgium for this purpose, in addition to the multitude of home-grown plants used in the same way.

The plants imported last fall have not, however, been entirely satisfactory, many of them having been nipped by frost before shipment, and thereby lost their buds.

For early work the favorite varieties are among the following: Deutsche Perle, double white; Fielder's White; Madame Van der Cruyssen, deep rose, and one of the best of its color; Eugene Mazel, red with dark blotch; and for cut-flower work *Indica alba* must not be omitted.

The bright yellow flowers of *Cytisus racemosus* (or *fragrans*) are also much appreciated; in fact, this may be said to be the most useful yellow-flowered plant for decorative purposes during the winter and spring months, its long racemes of flowers hanging down or standing out in accordance with the arrangement in view, but always graceful and pleasantly fragrant.

This Cytisus is readily rooted during the spring, and if potted on as the roots require more space and pinched back occasionally, will make shapely plants of fair size for use the following season. Lily-of-the-Valley, in flats and in pots, finds a ready sale, as do Daffodils and Tulips, the varieties of the latter that are used in this way being few in number, and comprising about half-a-dozen sorts of those generally used for forcing.

Freesia refracta alba is also to be had in pots, but does not seem to become as popular as Hyacinths. In fact, the market soon becomes overloaded with it, even in the winter. Marguerites and Pot Roses, the latter being mostly of the H. P. and China classes, are also plentiful and in good demand.

Holmesburg, Pa. *W. H. Taplin.*

The Spring Garden.

Scilla Anti-Taurica.—Among a number of early flowering Asia Minor bulbs with which Mr. Edward Whittall, the well known collector, favored me last fall, the above, now in flower, proves a gem, being not only very early, but probably the brightest Scilla yet introduced. The color is quite as bright as that of *Chionodoxa Sardensis*, and the flowers are as large. The nodding flowers are borne on rather short scapes, but this may be because the bulbs are not well established. This, however, is scarcely a fault, since the flowers cluster prettily among the leaves. A Scilla as bright as the Chionodoxa and with the superior foliage of the genus is a distinct gain, and lovers of fine hardy plants should note this variety.

Another Anti-Taurian Scilla bloomed in February; a very dwarf variety with three leaves and a single scape with a single nodding flower of the color of *S. Sibirica*. This might well be named *S. uniflora* were the name not already a synonym of *S. Sibirica*. The bulbs of this variety are singular in having a thin, reddish skin, like the Hyacinth. A third plant proves to be the early flowered blue Muscari, alluded to in a former article. The *Scilla bifolia* collected by Mr. Whittall proves to be identical with the European *S. bifolia*, having the same slaty blue, upright flowers borne on waving scapes. Blue, white and rose varieties of *S. bifolia* are all choice plants for the early garden. *Scilla trifolia* is another find of Mr. Whittall's, but being in a rather cold spot it has not yet bloomed with me. It perhaps may not be known to some readers of Garden and Forest that Mr. Whittall is an amateur, long resident in the East, who discovered in his hunting expeditions the richness of the flora of Asia Minor, especially in bulbous plants, many of which were either rare or quite unknown to cultivation. He has taken up the task of having a systematic collection of the flora made for his garden, and incidentally collects a surplus. We are already indebted to him for supplies of Chionodoxas in several varieties, Snowdrops, Scillas and *Anemone blanda*. Several new Frittellarias have been distributed this season, on which I hope to report soon.

Elizabeth, N. J. *J. N. Gerard.*

Double Cropping in the Garden.

It is not practicable in all gardens to grow more than one crop in a season. Land free from stone and clay, lying high, dry and level, is best suited for such attempts. A good way to begin is to plow in a heavy coat of manure in fall, and in winter or early spring to spread on as much more. This, worked into the soil as soon as it is dry in spring, with plow and harrow, furnishes food enough to carry two crops with the help of special fertilizers applied during the growing season.

Cabbage and Lettuce can grow together in rows three feet apart, the plants of Cabbage two and a half feet apart in the rows, with Lettuce between. Setting a row of Lettuce between each row would double the crop, but would necessitate hoeing by hand. Early Onion sets can be followed by Cucumbers. Onion seed sown in groups of six rows, with the next space left for a row of Celery, is a good arrangement, as the Onions can be off before it is time to bank the Celery. Spinach and Peas (of the dwarf varieties) make a good first crop, to be succeeded by Celery; early Beets and Sweet Corn hold the ground almost too long for the advantage of the Celery crop; Horse-radish set between plants of early Cabbage will come to maturity after the Cabbage is removed, and make good roots in one season's growth, if a small root six inches long is dropped into a hole eight inches deep every two feet when the rows are three feet apart at least. Early Radish or Spinach, between rows of Horse-radish, leave the ground early and give a long season for the Horse-radish. Beans can follow early Peas if planted by the 1st of July. Cucumbers planted the first week in July may succeed Spinach. Late Spinach can follow early Beets, and two crops of Beets—the last one sown July 15th—are not an impossibility. Two crops of Cabbage—an early and a late—can be grown on the same land, but a good season is necessary, and prompt connection between one crop and the other.

This double-cropping pays only on well-manured land, and should not be undertaken without such preparation. The secret of success is in supplying abundant plant-food to the growing crops, in soluble form, to make a quick growth. Perhaps there is nothing better for such a special fertilizer, applied in May and July, than nitrate of soda—broadcast and hoed into the soil. Its action is rapid and soon spent, and an over-application is a waste, as the plants only appropriate a small quantity. In dry times water must be supplied to carry along the crops. One great drawback in double-cropping is the tramping down and compacting the land, in the work necessary to keep the crops free of weeds and gather one crop, while not injuring the other, especially when both crops grow till July on the same ground. The earlier the first crop is removed the better, and the clearing of one crop before the other is placed in the land gives an opportunity to turn up the soil afresh. Where the horse can be used between rows less hand work of course is necessary, but double-cropping increases very much the area of the garden, and quickly-grown vegetables are much better than others.

West Springfield, Mass. *W. H. Bull.*

Phajus tuberculosus.

The representatives of the genus Phajus are rather more than twenty in number, and most of them are worthy of cultivation. This is particularly the case with the species now under consideration, as it is certainly one of the most beautiful in the genus. It has been known to botanical science for many years, and has passed under the generic names of Bletia and Limodorum. Until about ten years ago, however, it had not been in cultivation, and its appearance was then due to M. Léon Humblot, a young Frenchman, who succeeded in sending plants to Messrs. F. Sander & Co., St. Albans. On the homeward journey many plants died, but the few that were left commanded good prices at the London salesrooms. These have now been further augmented by a fresh importation, which Messrs. Sander received last year through the same traveler, and we may expect that this Orchid will be much oftener seen in future. Several plants from this last consignment are now flowering here in the nursery, and I have thus been able to make the following description from them: The dark green annulated stems, which are not quite so thick as one's little finger, are somewhat swollen at the base, and at the summit bear five or six lanceolate-acuminate, plaited leaves, nine to twelve inches long, and about two inches across in the widest portion. The stout, erect peduncle springs from below the leaves, and in the specimens seen has borne from six to ten large and handsome flowers, the white, twisted pedicels of which are furnished with a pale green spathaceous bract at the base. The broadly lanceolate-acute sepals and petals are pure white, less than two inches long, the former having a slightly raised median keel on the outer surface. To these a striking and attractive contrast is presented by the large three-lobed lip, the side lobes of which form a tube by meeting over the white and slender column. The inner surface of the side lobes is pale yellow, densely covered with deep brown spots, and there are also numerous silky hairs. The much-crisped middle lobe, which is cleft in front, is white, with numerous blotches of pale mauve near the edges, while on the anterior portion of the disc is a raised bright yellow, warty crest, and at the very base almost is a large tuft of erect, pale yellow, silky hairs.

This species is a native of the warm malarial swamps of the interior of Madagascar, and he who would possess it must run the risk of being stricken down at any moment by fever or other diseases, of which there seem to be many, according to travelers' accounts. Indeed, M. Humblot's constitution suffered so much by his last journey into the interior that he came home to France with the expectation of dying, but happily he has again recovered his health. A warm and moist atmosphere are the chief requisites for growing this Phajus successfully, the soil being a matter of little moment, as the

plants thrive just as well in peat as when grown simply in moss and fixed on a teak raft. Plenty of water must be given, but the chief danger to be guarded against is letting the soil or moss become sour or sodden by stagnant water. The winter temperature should be kept up to about seventy to eighty degrees Fahrenheit, and this, in conjunction with plenty of moisture as recommended, seems to be all that is of importance to induce the plants to produce their flowers freely. No doubt as this species gets more accustomed to the empiric art of the gardener, it may thrive at a somewhat lower temperature and under less exacting circumstances.

St. Albans, Eng. *John Weathers.*

Heuchera sanguinea.—I am pleased to be able to record the hardiness of this plant during the past winter, having left one out without the slightest protection as a test plant. It may be said that the last was not fairly a test winter; but with such plants as are evergreen and have their growing parts all above ground, as in *Heuchera sanguinea*, the fluctuations of temperature are more injurious than a continued period of severe weather, for under the one the plants are often incited into premature growth, and thus more easily killed, while during protracted severe weather the usual accompaniment of a coat of snow is the best possible protection against both sun and frost.

Aubrietia Leichtlini.—This new Aubrietia is now flowering with us for the first time, and if proof were necessary of its value as a garden plant other than that contained in the specific name the plant bears, it will be found in the decided bright rose color of the flowers. As is well known, all other Aubrietias have flowers of various shades of violet-blue, and their value as spring decorative plants for association with such plants as the varieties of the Moss Pink for spring effect cannot be overestimated. Aubrietias supply the one tint lacking in the many varieties of *Phlox subulata*. They are easily raised from seed; but if it is desired to perpetuate any particular variety, this must be done by division and cuttings in fall, as seedling plants vary considerably, especially where more than one variety is cultivated; so, taking into consideration this fact, it is safe to advise that *A. Leichtlini* be propagated by division. We once had a white Aubrietia under cultivation, but soon discarded it, owing to the insignificance of its flowers, which were no better than those of the common Chickweed.

Passaic, N. J. *O.*

Correspondence.

Some Practices in Grafting.

To the Editor of Garden and Forest:

Sir.—The art of grafting, like nearly all other arts, has had much new light thrown upon it during the past generation, and some of its abuses have already been pointed out and corrected. There remains, however, something still to do in calling attention to some misuses of the art, which, next to that of the hybridizer, is the most fascinating of horticultural processes. It is well to discuss its scientific side, and show all that can be shown of the almost infinitely varied influences of stock on cion and cion on stock.

It is desirable also to keep in full view the practical, every-day side of the matter. Some friends of gardening in England have fallen into the belief that because many ill-assorted unions of trees are sold and bring loss and disappointment, the whole practice had better be abandoned. Not many will agree with such a sweeping condemnation, but there is good reason to look carefully into the misapplication of the art. When a whole section of a country engaged in fruit-growing finds that a certain fruit grafted on a given stock cankers and fails, we cannot blame people if they try other stocks, and finally settle down to the practice of growing this fruit on its own roots, if it does better so. When a tree is so short-lived on another stock as to be valueless in two or three years, it is folly for nurserymen to continue its propagation in that way. A choice variety of anything grafted upon a stock which is absolutely sure to send up a multitude of suckers and overwhelm it, is a delusion and a loss, and this loss falls heaviest, finally, on the nursery trade.

An instance of this is the budding or grafting of the new varieties of Lilacs upon a stock of common Lilac, as are all those sent out from European nurseries. An example of a good plant on a stock where it will live but a very few years is *Prunus triloba*, the so-called Flowering Almond on Plum or Peach stocks. A mere touch separates the plant from the stock. Another is found in the working of the Rose Acacia on *Robinia Pseudacacia* with precisely the same results. So long has this sort of propagation been practiced that I know of many nurserymen, both in this country and Europe, who have never seen either the Flowering Almond or the Rose Acacia on its own roots, and some have even told me that neither would grow in that way. I have had the pleasure of sending specimens on their own roots to the unbelievers. There are really many things that would be far better on their own roots than grafted upon any other stock whatever, and there exists no sound reason for grafting such things at all. Some of this sort are the following: Wier's Cut-leaved Maple, most varieties of Elm and every sort of grafted shrub on stock which suckers, since they can all be layered so very easily. The Plum on Peach stock may serve a useful purpose on sandy soils, but the indiscriminate sending out of budded Plum-trees is working untold harm to the general nursery trade.

The use of a tender stock for plants which must endure a greater degree of cold than the stock can stand is illustrated by the use of *Rhododendron Ponticum* as stock for *R. Catawbiense* hybrids. It has caused considerable losses of this beautiful plant in Massachusetts, and the best growers now see the desirability of raising them all from layers on their roots.

Another plant that is far better on its own roots is the Quince. As grown now, the new sorts of Quince are budded on the common sort, which, after a few years, send up suckers on every side, and these are very difficult to distinguish. Why not grow these choice sorts from layers or cuttings? The double and also the white Wistarias are now almost universally grafted on the common purple sort, and they are often ruined by the more vigorous suckers of the stock. Why do we graft such a plant at all, when by getting them on their own roots by layering we can then multiply them ad infinitum, by root cuttings, as easily as we can raise Peas?

Much labor is applied to the grafting of such trees as the Purple, Cut-leaved and Weeping Beeches, which are very difficult to graft out-of-doors, when they might be far more cheaply and better multiplied by layers. I was greatly interested in a well known, huge Beech, in Kew gardens, last season, which has rooted the tips of its immense, horizontal branches into the soil, and produced, at each of these reinforced points, a large and finely formed tree, so that a ring of these now surrounds the plant. The perfect success of these layers showed what could be done by this method in multiplying these fine trees.

The evident truth is that we often take the worse and more expensive way of propagating many useful plants simply through habit.

Cambridge, Mass. *F. L. Temple.*

Longevity of the Elm.

To the Editor of Garden and Forest:

Sir.—There are several of our eastern trees—the Sycamore and the Tulip-tree, for instance—which attain much greater size than the White Elm. But the finest specimens of original growth—noble individuals, whose commanding stature required the lapse of many centuries—were ruthlessly swept off in the times of early settlement; and it happens now that in most of the older parts of the country the champion trees for size are Elms.

Dr. Holmes, who, in his lively way, has "interviewed" various notable individual Elms of New England, gives it as the result of his observations, that the species is not long lived, and he doubts whether any last beyond two or three centuries. Is this limit well substantiated? Data pertaining to the age of a tree are seldom obtainable. All its early years it is in no way conspicuous among its fellows, as is so frequently the case with the adolescence of centenarian claimants; and in such cases questions of longevity are difficult to decide.

There is an Elm in this town whose trunk, in the smallest place between roots and branches, girths nineteen feet three inches; this at five feet from the ground. At two feet six inches high the circumference is twenty-two feet. In 1817 one half of the tree was killed by the burning of a house at close quarters; but the tree recovered, and the only trace remaining is a deep scar upon one side of the trunk. A lady of the vicinity used to tell of having seen in her childhood a pair of oxen running away over the tree which passed under the yoke, springing up behind them! This occurred only ninety-five years ago. This large tree is evidently in its old age, though still possessing considerable vigor.

The Sterling Elm is a notable tree in the pleasant village of Sharon, Connecticut, on the grounds of Mr. W. O. Wheeler. With a spread of 110 feet, the smallest girth of its trunk is seventeen feet. The trunk is very solid and cylindrical, and the tree is in full vigor. Sharon was first settled 150 years ago; and the position of this tree indicates that it was planted. This

was probably considerably after the settlement. I doubt whether this Elm exceeds a century in age; but it has already reached dimensions surpassed by very few.

The Deming Elm is another old tree in the same town. The smallest girth of its trunk, which is quite irregular, is sixteen feet three inches. Its total dimensions, however, are much inferior to the Sterling Elm's, and the tree is evidently in decadence. It was planted "in his youth" by the late Stephen Deming, and he was born in 1780.

Such instances as these indicate that Dr. Holmes' limit is unnecessarily wide, and that the normal age of this rapid growing tree is considerably within the popular estimate.

To show the rate of growth, an Elm by my own house, which is known to be scarcely, if at all, above fifty years old, may be mentioned. Its situation is very favorable—a warm, rich soil, within a few feet of a large spring. How commonly we find that great Elms have seated themselves near some perennial fountain or water-course, at least within reach of their courier roots! This Elm of half a century, with a trunk twenty feet to the limbs, measures in circumference at three feet high, and entirely above the spread of the roots, eight feet six inches.

Amenia, N. Y. *Myron B. Benton.*

A Silva of New England.

To the Editor of Garden and Forest:

Sir.—The earliest Silva of New England is contained in the following lines, which may interest some of your readers. They were printed in 1670 in London in "A True, and Faithful Account of the chiefest Plantations of the English in America, to wit of Virginia, New England, Bermudus, Barbados." The name of the author does not appear, but the remarks which he adds upon the value and use of some of the New England trees, and of their fruits, are copied, with a few verbal changes, from Wood's well known "New England Prospect," published in 1634.

"Trees both on Hills and Plains in plenty be,
The long-liv' Oake, and mournful Cyprefs Tree,
Sky-towring Pines, and Chefnuts coated rough,
The lafting Cedar, with the Walnut tough;
The Rofin-dropping Fir for Mafts in ufe,
The Boatmen feek for Oars, light, neat grown Sprufe;
The brittle Afh, the ever trembling Afpes,
The broad-fpread Elme, whofe concave harbours Wafps;
The watry fpungy Alder good for nought,
Small Elder by th' Indian Fletchers fought,
The knotty Maple, pallid Birch, Hawthorns,
The Horn-bound Tree that to be cloven fcorns;
Which from the tender Vine oft takes his Spoufe,
Who twines imbracing arms abut his Boughs;
Within this Indian Orchard Fruits be fome,
The ruddy Cherry and the jetty Plumb,
Snake murthering Hafel with fweet Saxafrage,
Whofe fpouts in Beer allayes hot Feavers rage,
The Diars Shumack, with more Trees there be,
That are both good for ufe, and rare to fee."

Boston. *F. Skinner.*

Recent Publications.

The Fern Flora of Canada. Descriptions of all the Native Ferns of the Dominion, with localities where they grow. By George Lawson, Ph.D., LL.D., F.I.C., F.R.S.C., McLeod Professor of Chemistry, Dalhousie University. Halifax, N. S.: A. & W. Mackinlay.

This is a small quarto of about thirty pages (pp. 221–251), and is evidently an appendix to some other work, perhaps a school Flora of the Dominion. Professor Lawson has paid much attention to Canadian Ferns for many years, and is well qualified to write about them. The book begins with about seven pages of a general account of the nature and structure of Ferns, given in simple style, such as would be easily understood by the children for whose use the treatise has been prepared. Then follow a synopsis of the genera, twenty-five in number, and a plate with illustrations of seventeen of them. An account of the species occupies the remaining twenty-one pages. The descriptions are clear and simple, and have the merit of originality, none of them, apparently, being borrowed from other authors. Professor Lawson seems to have adhered faithfully to the rule of priority in his choice of specific names, even going so far as to take up Oakes' MS. name of *Asplenium platyneuron* instead of *A. ebeneum*. But it is not certain, after all, that Linnæus had this plant in mind when he wrote the name *Acrostichum platyneuron*. Willdenow plainly says that Linnæus' synonymy was all wrong, and the only specimen of this Fern in the Linnæan herbarium is marked *Polypodium auriculatum*. *Asplenium marinum* is still mentioned as a Canadian plant, although no one has claimed to have found it since Captain Kendal, and although Macoun and Burgess say that the crediting of this plant to New Brunswick "is now known to have been a mistake."

Struthiopteris is kept separate from Onoclea, perhaps well enough. Aspidium is replaced by Polystichum and Lastrea. Athyrium is separated from Asplenium, and Dennstædtia is preferred to Dicksonia for *D. punctilobula*.

But, of course, Fern-students cannot be expected to agree in nomenclature any more than other botanists, and each one will continue to call species by whatever names he thinks preferable.

Exhibitions.

The Flower Show at Philadelphia.

The Spring Exhibition of the Pennsylvania Horticultural Society, which was held last week, was very largely attended and in every way successful, although in some features it fell below the standard of previous years. The display of Roses, for example, was not strong as compared with former exhibitions. This, however, was no fault of the growers; but the effects of an unfavorable season were plainly visible. Nevertheless such flowers of Ulrich Brunner as those for which Edwin Lonsdale gained the first prize were well worth mention. Indeed, this variety was superior to all others shown here this year in the qualities which make a first-class Rose. Among other varieties, C. F. Evans showed the best blooms of Magna Charta, Mrs. John Laing, La France, Papa Gontier, The Bride and Merveille de Lyon. Joseph Heacock took the first prize for Perle des Jardins, Niphetos, W. F. Bennett and Sunset. Besides his prize for Ulrich Brunner, Edwin Lonsdale showed the finest blooms of Madame Hoste, Madame Cusin and Madame Gabriel Luizet. The display of Souvenir de Wootton was somewhat disappointing in view of the fact that $300 in prizes were offered to successful competitors. John N. May, of Summit, New Jersey, Joseph Heacock, of Jenkintown, Pennsylvania, and Coles & Whitely, of Lansdowne, received the first, second and third prizes for this variety.

The display of Orchids in bloom was excellent, especially the collection of Pitcher & Manda, which included some eighty plants of Cypripedium and almost as many of other genera. A superb specimen of *Cypripedium Boxallii atratum* with thirty-two flowers was among the gems of this collection. Other noteworthy Cypripediums were *C. Selligerum* and its variety *majus;* Pitcher's variety of *C. Harrisianum; C. Curtisii; C. Lowii; C. Œnanthum superbum* and some beautiful examples of the snow-white little *C. niveum*. Among the Cymbidiums was a good specimen or the dark-colored variety of *C. Lowianum*. A fine specimen of the white *Lycaste Skinneri*, and some choice plants of the fragrant little *Angræcum Sanderianum* attracted much attention. David Emery, gardener to Charles Dissel, and Charles F. Evans also received prizes for Orchids.

The spring flowering bulbs were less abundant than usual, but more beautiful Hyacinths than those shown by Henry Surman are rarely seen. The immense Azaleas shown by Robert Wark, gardener to Mr. C. H. Clark; the great mass of *Astilbe Japonica* from Craig & Brother; the White Lilies contributed by C. D. Ball, W. K. Harris and J. W. Colflesh; the Cinerarias shown by Thomas Long; and Pitcher & Manda's group of Anthuriums, were attractive features of the exhibition.

The display of decorative or foliage plants was unusually good. It would be hard to find a better collection of specimen Ferns than those furnished by Thomas Long, gardener to A. J. Drexel. Every one was perfect. A *Gleichenia flabellata* nearly six feet across, *G. dichotoma* of more than half that diameter, *Polypodium aureum areolatum* and *Davallia pallida*, were among the best. Wm. Joyce, gardener to Miss M. L. Baldwin; Robert Wark, gardener to C. H. Clark, and David Lutz, showed fine groups of Palms, Ferns, Dracænas and other plants grown for decorative purposes, and special premiums were awarded to H. A. Dreer and Charles Dissel for collections of foliage plants and Orchids arranged for decorative effect.

One of the remarkable plants of the exhibition was a *Heliconia aureo-striata* from the gardens of Mr. Drexel, which was shown for the first time in Philadelphia. Another was a plant of *Lilium Harrisii*, the stem of which separated into four branches about four inches from the ground. There were twenty-two buds on all the branches, but only half this number came to perfection. It was grown by Mr. C. D. Ball, of Holmesburg, Pennsylvania.

Notes.

Messrs. Henry Holt & Co. are about to publish an "Introduction to Systematic Botany," by Professor Charles E. Bessey, of the University of Nebraska, well known by the botanies which bear his name in the American Science Series.

The new edition of Darwin's famous "Naturalist's Voyage Around the World," which has just been issued by the Messrs. Appleton, is noteworthy as containing maps and 100 views of the places visited and described. These are chiefly from sketches taken on the spot by Mr. R. T. Pritchett, and greatly add to the interest of the book.

Two noted Australian nut-bearing trees, which have been tested at the University of California, are the *Grevillea annulata* and the *Macadamia ternata*. The latter is an extremely handsome Holly-leaved tree, but of slow growth until well established. It suffered from frost once, but is hardy at Niles. The former is quite tender at Berkeley, and not a success there.

Messrs. A. B. Seymour and F. S. Earle, of Cambridge, Massachusetts, announce the publication of a series of fascicles, under the name of "Economic Fungi," to illustrate the diseases of useful and noxious plants. Each issue is to have a distinctive character, and the first, which is now ready, treats of fifty species. The fascicles will be supplied either in book form or in loose sheets at the price, respectively, of $3.50 and $3.

The leaf-blight of Quince and Pear (*Entosporium maculatum*, Lev.) has of late years been increasing in our orchards and nurseries, causing leaves to fall and the fruit to crack. Professor Dudley, of Cornell University, reports that the disease can be controlled in all its stages by the copper solutions, so that the nurseryman or fruit-grower who sprays the leaves of his trees once in two or three weeks during the growing season will probably suffer no loss from this cause.

Consul Fay, writing to our State Department from Stettin, says that the potato crop is one of the best paying in Prussia, and the products therefrom—dextrine, potato-flour, starch, etc.—shipped to the United States from the port of Stettin during the last three months amounted to $50,000. German manufacturers are at a loss to understand why we purchase these products abroad when we have such immense crops of corn, when it is realized that the percentage of dextrine in corn is fifty per cent. greater than in potatoes.

When the gum drawn from *Ficus elastica* was first discovered to possess economic value no one could have foreseen the myriad ways in which it would eventually be put to use. The most recent, perhaps, and certainly one of the most curious, is reported in the *Engineering and Mining Journal*, which says that experiments are being made in Germany with India rubber pavements. They were first laid on the carriage-road of a bridge at Linden, Hanover, and are now being tested in Berlin and Hamburg with "extremely satisfactory results. India rubber is said to combine the hardness of the stone pavement with the elasticity of asphalt, but does not become so slippery as asphalt."

At the Agricultural Exhibition which has just closed, in Paris, M. Millet, a horticulturist of Bourg-la-Reine, showed a really remarkable collection of Violets. The most interesting were Monsieur Arène, with large, dark violet, velvety flowers; Gloire de Bourg-la-Reine, with very ample, dark green foliage and extraordinarily large, pale blue flowers with rounded petals; Souvenir de Millet Père, with pale foliage and blue flowers; Armadine Millet, with leaves broadly margined with yellowish white and with small, dark blue flowers; Madame Millet, a variety of Parma with large flowers of a tender rose color, very agreeably perfumed, and Swanley White, another variety of Parma with white flowers.

It is well known that when our western districts were first settled the best woods were wasted or put to services for which inferior sorts would have answered, with no thought of their future possible value. This was notably the case with the wood of the Black Walnut, of which a recent writer in the *Commercial Advertiser* says: "Thousands of fine trees were cut down, burned or allowed to rot on the ground, or split up for old-fashioned rail-fences. Now buyers rummage every mile of territory in the state (Iowa) to find logs and put them on the cars to be carried thousands of miles across the ocean to be worked up into furniture for the adornment of European palaces." It is said that last year between 1,200 and 1,500 car loads of old walnut logs were thus exported.

The Fuchsia, now one of the commonest of garden plants, was introduced into cultivation about a hundred years ago by Mr. James Lee, a nurseryman of Hammersmith, who saw a plant growing in the window of a sailor, who had brought it from the West Indies. The genus had, however, been discovered much earlier, as it was described in 1705 by Plumier, who named it for Leonard Fuchs, a Bavarian botanist of the sixteenth century. According to a writer in the *Revue de l'Horticulture Belge*, the species, or one of the species, known to Plumier was *Fuchsia triphylla*, which was subsequently lost sight of until re-discovered in 1884 on the Island of St. Domingo and sent to Kew for identification. Its flowers are a glowing cinnamon-red, and about an inch and a half in length.

The Eucharis mite (*Rhizoglyphus Robini*) occurs much more frequently on Hippeastrums than is commonly supposed. Mr. Veitch, in his recent essay on these plants, does not, however, recommend the destruction of all bulbs affected with this pest; on the contrary, he states that he has never seen a bulb so badly infested as to be incurable. Excessive watering, in Mr. Veitch's opinion, affords the conditions favorable to the increase of the mite and the destruction of the bulbs, which is only another way of saying, keep the bulbs from falling into weak health, and the mite will not hurt them, although it may be present. At Kew there are large bulbs of *H. aulicum*, which have been in the collection for years and have flowered annually notwithstanding undoubted evidences that the mite is upon them and has been there all along.

One of the most individual and interesting of the many admirable statues which adorn the streets and parks of Paris is Fremiet's "Jeanne d'Arc," in the Place des Pyramides. Nevertheless, after it had stood for a number of years, the sculptor was so dissatisfied with it that he prepared a new statue on the same general lines in the hope that he would be allowed to substitute it for the earlier one at his own expense. His request was refused, however, by the municipality, and if it is true, as recently stated, that the Fairmount Park Association has secured the new statue, they are to be congratulated upon the possession of a work of surpassing excellence and beauty. As shown in drawings that were published last summer in Paris, it preserves the poetic and delicate individuality of the original, while the changes made in the horse, the harness, the pose of the heroine's arm and the form of the standard she carries all seem distinct improvements.

Catalogues Received.

G. J. Kellogg & Sons, Janesville, Wis.; Large and Small Fruits, etc.—F. W. Kelsey, 208 Broadway, New York; Fruit and Ornamental Trees, Shrubs, Roses, etc.—Harlan P. Kelsey, Highlands, N. C., and after June 1st, Linville, Mitchell County, N. C.; Plants and Flowers of the Southern Alleghany Mountains.—John Laing & Sons, Forest Hill, London, S. E., Eng.; Seeds, Plants, etc.—F. E. McAllister, 22 Dey St., New York; Bulbs and Seeds.—McGregor Bros., Springfield, O.; Flowers.—The Mapes Formula and Peruvian Co., 158 Front St., New York; Manures.—W. H. Maule, 1711 Filbert St., Philadelphia, Pa.; Seeds.—Thomas Meehan & Son, Germantown, Philadelphia, Pa.; Ornamental Trees, Vines, Shrubs, Fruits.—H. Meyers (late Woolson & Co.), Passaic, N. J.; Hardy Perennial Plants, Bulbs, Ferns and Climbers.—The Wm. H. Moon Co., Glenwood Nurseries, Morrisville, Bucks County, Pa.; Fruit and Ornamental Trees, Shrubs, Vines, etc.—A. C. Nellis & Co., 62 Cortlandt St., New York; Seeds, Bulbs, Plants.—Park Nursery Co., Pasadena, Cal.; Roses, Chrysanthemums, Carnations, Fuchsias.—Wm. Parry, Parry, N. J.; Ornamental Trees, Fruits, etc.—Parson's & Sons Co., Ltd., Flushing, N.Y.; Hardy Ornamental Trees, Flowering Shrubs and Vines.—Wm. Paul & Sons, Waltham Cross, Herts, Eng.; Roses.—Carl Purdy, Ukiah, Cal.; California Bulbs.—W. W. Rawson & Co., 34 So. Market St., Boston, Mass.; Vegetable and Flower Seeds.—George Richardson, Lordstown, O.; Oriental Nelumbiums.—John Saul, 621 Seventh St., Washington, D. C.; New and Rare Plants, Roses, etc.—Schlegel & Fottler, 26 So. Market St., Boston, Mass.; Seeds, Plants, etc.—Siebrecht & Wadley, Rose Hill Nurseries, New Rochelle, N. Y.; Palms, Orchids, Ferns, etc.—B. F. Smith, Lawrence, Kan.; Strawberries.—E. D. Sturtevant, Bordentown, N. J., and Los Angeles, Cal.; Rare Water Lilies and other Aquatic Plants.—Temple & Beard, Shady Hill Nurseries, Cambridge, Mass.; Choice Hardy Perennials.—J. M. Thorburn & Co., 15 John St., New York; French Hybrid Gladiolus, Lilies and other Spring Bulbs.—John Thorpe, Pearl River, N. Y.; Chrysanthemums.—J. C. Vaughan, 88 State St., Chicago, Ill.; Seeds.—James Vick, Rochester, N. Y.; Seeds.—Vilmorin-Andrieux & Cie., 4 Quai de la Mégisserie, Paris, France; Seeds, Bulbs, etc.—A. L. Wood, Rochester, N. Y.; Fruit Trees, Small Fruits, Shrubs, etc.—D. G. Yates & Co., 5774 Germantown Ave., Philadelphia, Pa.; Evergreens, Ornamental Trees, Fruit Trees, Roses, etc.